



HARTCROWSER

Earth and Environmental Technologies

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J-2296-07

July 29, 1998

Mr. Gregory A. Rapp
Construction Services Manager
Potlatch Corporation
1100 Railroad Avenue
P.O. Box 386
St. Maries, Idaho 83861

Re: First Quarter 1998 Performance Report
Avery Landing Recovery System

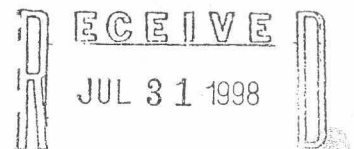
Dear Mr. Rapp:

Hart Crowser is pleased to present the First Quarter 1998 Performance Report for the free product recovery system at the Avery Landing site. This letter report presents the first quarter groundwater elevation and product thickness measurements.

GROUNDWATER AND PRODUCT QUARTERLY MONITORING

Four extraction wells (EW-1 through EW-4), three monitoring wells (HC-1, HC-4, and MW-5), and two piezometers (P-1, and P-2) were monitored on June 25, 1998. At each monitoring location, depth to product, product thickness, and depth to groundwater measurements were recorded. These measurements are presented with those of previous monitoring rounds in Table 1. If a location indicated the presence of product but we were unable to obtain a product thickness measurement, it is indicated in Table 1 as a sheen in the depth to product column. The river elevation adjacent to each extraction well vault was also monitored by measuring the elevation

Division of Environment



Coeur d'Alene Field Office



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difference between the top of the vault and the river. These measurements are also provided in Table 1.

Extraction wells EW-2 and EW-3 contained 0.45 and 0.65 foot of product, respectively. Extraction well EW-4 contained a trace of product. Well HC-4 continues to have product present, with a thickness of 0.96 foot detected during the current monitoring round. Wells EW-1, HC-1, MW-5, and the piezometers did not indicate the presence of product. The pump controller for extraction well EW-4 failed the day before the first quarter monitoring event. It was changed out during the site visit.

Extraction wells EW-2 and EW-3 are maintaining groundwater capture. Extraction wells EW-1 and EW-4 were not maintaining groundwater capture on the day of monitoring due to spring runoff and the pump controller failure, respectively. We believe EW-4 was maintaining groundwater capture prior to the pump controller failure.

The optimization of EW-1 pumping rate during the 1997 monitoring events continued to reduce the difference in elevation between the groundwater in that well and the river. Review of the past several years' monitoring data shows a reduction in the difference between well and river elevations from an order of feet to inches. We believe capture will be maintained during the dry season.

*need to
look into
further*

Containment booms were scheduled to be in place, on the river, by July 1, 1998.

PROJECT SCHEDULE

Table 2 presents the project schedule for the remainder of 1998. The three quarterly monitoring events listed correspond to the three quarters of the year that the treatment system operates on the site, beginning in late spring and ending in late fall. Since the system does not operate during the fourth quarter, winter months, no well monitoring shall occur. As indicated, we will submit an Annual Report for 1998 by February 1999. If you should decide that this date needs to be altered, please let us know as soon as possible.



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**Table 2 - Avery Landing Recovery System
Remaining Project Schedule for 1998**

Remaining Schedule	Date
Conduct Second Quarter Monitoring	August 12, 1998
Submit Second Quarter Performance Report	September 4, 1998
Conduct Third Quarter Monitoring	October 22, 1998
Submit Third Quarter Performance Report	November 13, 1998
Submit Annual Report	February 5, 1999

LIMITATIONS

Work for this project was performed, and this letter report prepared, in accordance with generally accepted professional practices for the nature and conditions of the work completed in the same or similar location, at the time the work was performed. It is intended for the exclusive use of the Potlatch Corporation for specific application to the referenced property.

If additional information or clarification is required, please call Terry Montoya at (206) 324-9530.

Sincerely,

HART CROWSER, INC.

TERRY MONTOYA
Project Engineer

DAVID HEFFNER, P.E.
Associate Engineer

229607/1stQuart98.doc

Attachments:

Table 1 - Avery Landing Groundwater and River Monitoring Data
Figure 1 - Avery Landing Well Location Map

cc: Kreg Beck, Idaho Department of Environmental Quality



Table 1 - Avery Landing Groundwater and River Monitoring Data

Monitoring Location	Date	Depth to Product	Depth to Water	Product Thickness	T.O.C. Elevation	Groundwater Elevation	Surface Water Elevation
EW-1	10/27/94	ND	11	0	95.34	84.34	
	6/30/95	ND	10.9	0	95.34	84.44	
	9/21/95	11.25	11.27	0.02	95.34	84.07	
	7/11/96	ND	9.74	0	95.34	85.60	
	9/11/96	ND	10.88	0	95.34	84.46	
	11/5/96	ND	11.94	0	95.34	83.40	
	7/17/97	ND	10.38	0	95.34	84.96	
	10/9/97	ND	13.17	0	95.34	82.17	
	6/25/98	ND	10.01	0	95.34	85.33	
EW-2	10/27/94	ND	10.37	0	95.24	84.87	
	6/30/95	10.57	10.89	0.32	95.24	84.35	
	9/21/95	13.9	13.92	0.02	95.24	81.32	
	7/11/96	11.03	11.66	0.63	95.24	83.58	
	9/11/96	Sheen	14.00	0	95.24	81.24	
	11/5/96	Sheen	12.27	0	95.24	82.97	
	7/17/97	8.99	9.09	0.1	95.24	86.15	
	10/9/97	Sheen	15.44	0	95.24	79.80	
	6/25/98	9.19	9.64	0.45	95.24	85.60	
EW-3	10/27/94	ND	10.05	0	95.78	85.73	
	6/30/95	9.35	9.8	0.45	95.78	85.98	
	9/21/95	10.92	11.08+	0.16	95.78	84.70	
	7/11/96	8.53	8.64	0.11	95.78	87.14	
	9/11/96	10.75	11.70	0.95	95.78	84.08	
	11/5/96	Sheen	11.8	0	95.78	83.98	
	7/17/97	9.13	9.33	0.2	95.78	86.45	
	10/9/97	10.9	11.68	0.78	95.78	84.10	
	6/25/98	8.78	9.43	0.65	95.78	86.35	
EW-4	10/27/94	ND	8.05	0	94.32	86.27	
	6/30/95	7.84	7.85	0.01	94.32	86.47	
	9/21/95	8.22	8.24	0.02	94.32	86.08	
	7/11/96	Sheen	6.44	0	94.32	87.88	
	11/5/96	Sheen	8.08	0	94.32	86.24	
	7/17/97	Sheen	5.43	0	94.32	88.89	
	10/9/97	Sheen	7.11	0	94.32	87.21	
	6/25/98	5.28	5.3	0.02	94.32	89.02	
HC-1	10/27/94	ND	13.25	0	97.50	84.25	
	6/30/95	ND	12.00	0	97.50	85.50	
	9/21/95	NM	13.42	0	97.50	84.08	
	7/11/96	ND	11.92	0	97.50	85.58	
	9/11/96	ND	12.90	0	97.50	84.60	
	11/5/96	Could not locate due to snow					
	7/17/97	ND	11.27	0	97.50	86.23	
	10/9/97	ND	12.87	0	97.50	84.63	
	6/25/98	ND	11.85	0	97.50	85.65	

Table 1 - Avery Landing Groundwater and River Monitoring Data

Monitoring Location	Date	Depth to Product	Depth to Water	Product Thickness	T.O.C. Elevation	Groundwater Elevation	Surface Water Elevation
HC-4	10/27/94	13.3	15.34	2.04	98.94	83.60	
	6/30/95	11.89	15.49	3.6	98.94	83.45	
	9/21/95	13.67	NM	NM	98.94	85.27	
	7/11/96	11.58	12.93	1.35	98.94	86.01	
	9/11/96	13.53	13.93	0.40	98.94	85.01	
	11/5/96	11.82	13.62	1.80	98.94	85.32	
	7/17/97	11.65	13.25	1.60	98.94	85.69	
	10/9/97	12.67	14.92	2.25	98.94	84.02	
	6/25/98	11.53	12.49	0.96	98.94	86.45	
HC-5	11/5/96	ND	11.22	0	97.95	86.73	
	7/17/97	Monument under standing water					
	10/9/97	Monument under standing water					
	6/25/98	Monument under standing water					
MW-4	9/14/94	ND	12.88	0	99.76	86.88	
	6/30/95	ND	10.19	0	99.76	89.57	
	9/21/95	ND	11.95	0	99.76	87.81	
	7/11/96	Sheen	10.18	0	99.76	89.58	
	9/11/96	Sheen	11.33	0	99.76	88.43	
	11/5/96	Lost during road construction					
MW-5	10/27/94	ND	10.45	0	97.76	87.31	
	6/30/95	ND	9.13	0	97.76	88.63	
	9/21/95	ND	10.83	0	97.76	86.93	
	7/11/96	ND	8.98	0	97.76	88.78	
	9/11/96	ND	10.71	0	97.76	87.05	
	11/5/96	ND	10.65	0	97.76	87.11	
	7/17/97	ND	8.75	0	97.76	89.01	
	10/9/97	ND	10.89	0	97.76	86.87	
	6/25/98	ND	8.56	0	97.76	89.20	
MW-11	9/14/94	12	NA	NA	98.16	NA	
	6/30/95	5.54	7.25	1.71	98.16	90.41	
	7/11/96	6.34	10.00	3.66	98.16	88.16	
	9/11/96	3.25	7.20	3.95	98.16	90.96	
	11/5/96	3.05	7.20	4.15	98.16	90.96	
	7/17/97	6.33	9.99	3.66	98.16	88.17	
P-1	10/27/94	ND	17.31	0	101.42	84.11	
	6/30/95	ND	16.72	0	101.42	84.70	
	9/21/95	ND	17.4	0	101.42	84.02	
	7/11/96	ND	15.87	0	101.42	85.55	
	9/11/96	ND	16.98	0	101.42	84.44	
	11/5/96	ND	17.06	0	101.42	84.36	
	7/17/97	ND	15.34	0	101.42	86.08	
	10/9/97	ND	17.64	0	101.42	83.78	
	6/25/98	ND	14.53	0	101.42	86.89	

Table 1 - Avery Landing Groundwater and River Monitoring Data

Monitoring Location	Date	Depth to Product	Depth to Water	Product Thickness	T.O.C. Elevation	Groundwater Elevation	Surface Water Elevation
P-2	10/27/94	ND	15.87	0	100.06	84.19	
	6/30/95	ND	15.26	0	100.06	84.80	
	9/21/95	ND	16.04	0	100.06	84.02	
	7/11/96	ND	14.52	0	100.06	85.54	
	9/11/96	ND	15.62	0	100.06	84.44	
	11/5/96	ND	15.08	0	100.06	84.98	
	7/17/97	ND	13.92	0	100.06	86.14	
	10/9/97	ND	16.09	0	100.06	83.97	
	6/25/98	ND	15.95	0	100.06	84.11	
River at EW-1	10/27/94						83.12 *
	6/30/95						84.03 **
	9/21/95						82.24
	7/11/96						83.74 ***
	9/11/96						82.56
	11/5/96						83.16
	7/17/97						82.39
	10/9/97						83.00
	6/25/98						85.22
River at EW-2	10/27/94						84.41
	6/30/95						85.32
	9/21/95						83.53
	7/11/96						85.03
	9/11/96						83.85
	11/5/96						83.59
	7/17/97						85.35
	10/9/97						84.20
	6/25/98						86.42
River at EW-3	10/27/94						85.16 *
	6/30/95						86.07
	9/21/95						84.28
	7/11/96						85.78 ***
	9/11/96						84.60
	11/5/96						84.10
	7/17/97						86.31
	10/9/97						85.16
	6/25/98						87.38

Table 1 - Avery Landing Groundwater and River Monitoring Data

Monitoring Location	Date	Depth to Product	Depth to Water	Product Thickness	T.O.C. Elevation	Groundwater Elevation	Surface Water Elevation
River at EW-4	10/27/94						86.49 *
	6/30/95						87.40
	9/21/95						85.61
	7/11/96						87.11 ***
	9/11/96						85.93
	11/5/96						86.44
	7/17/97						87.27
	10/9/97						86.12
	6/25/98						88.34

Notes:

All measurements in feet.

* River elevation was extrapolated from the river surface slope measured in 1995 and the river elevation measured south of EW-2 in 1994.

** River elevation was extrapolated from river surface slope, based on river elevations measured south of EW-2, EW-3, and EW-4 in 1995.

*** River elevation was extrapolated from river surface slope, and the wood dock benchmark.

T.O.C. - Top of Casing

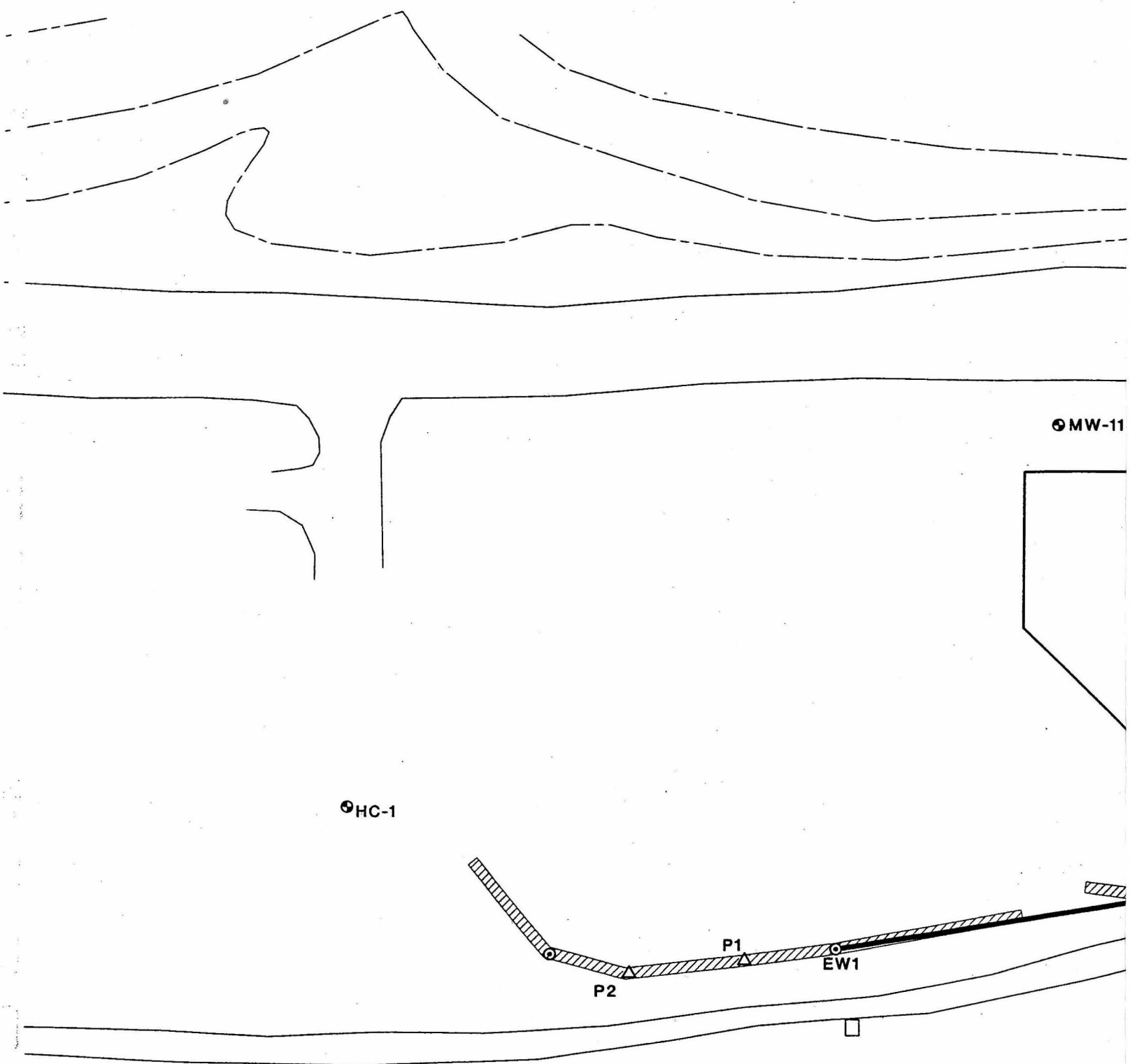
ND - Not Detected

NA - Not Available

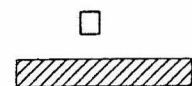
NM - Not Measured

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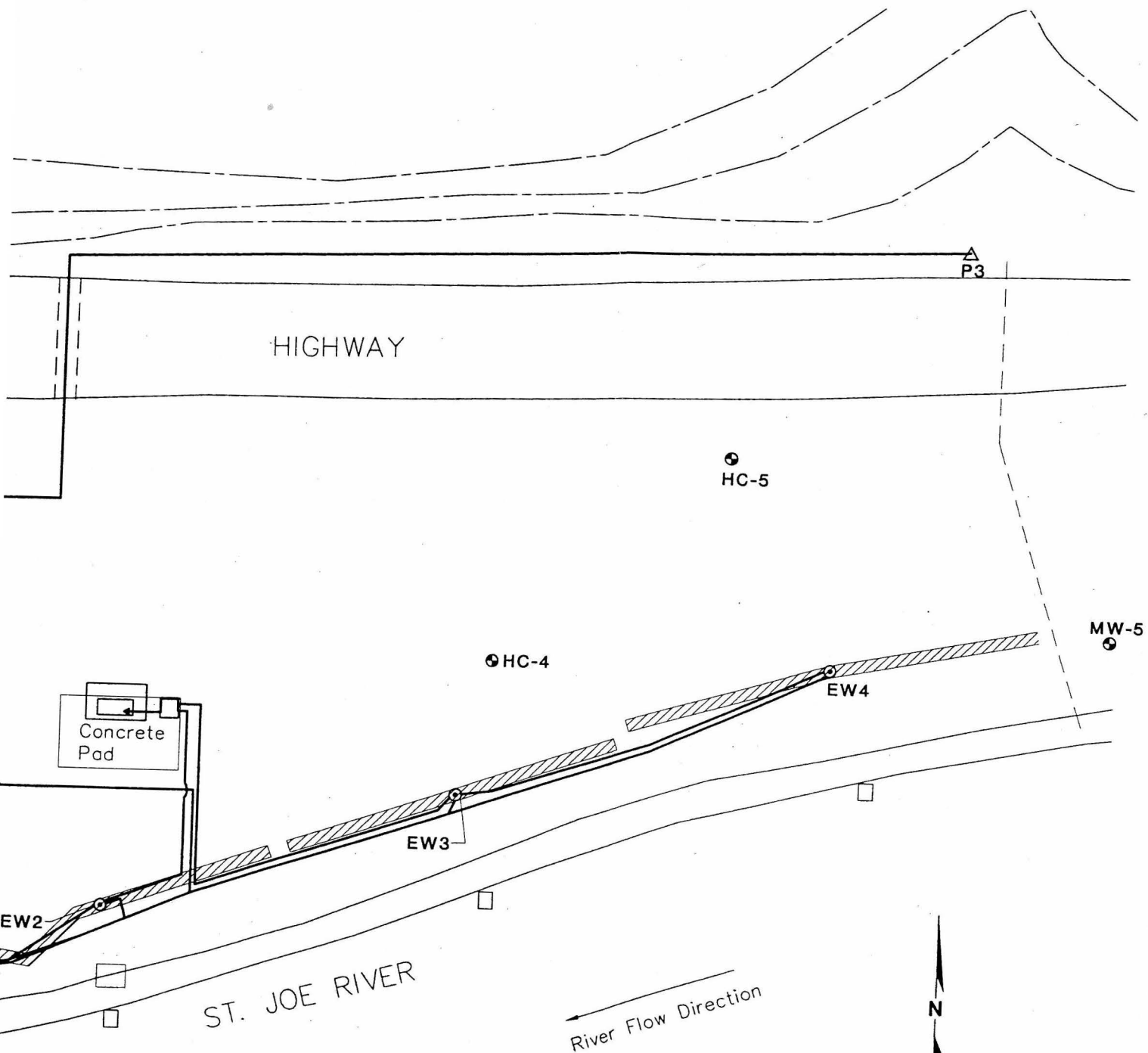
Avery Landing Well Location Map



- MW-4 Monitoring Well Location and Number
- EW1 Extraction Well Location and Number
- △ P1 Piezometer Location and Number

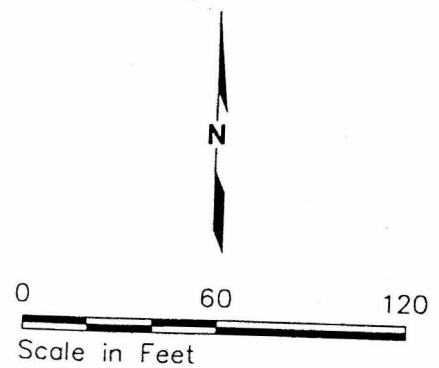


Riv
Ex



Elevation Monitoring Point
Excavation Trench

Note: Elevation datum is southwest
corner of Concrete Pad (100.00 feet)



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Figure 1